

REMARKS

The Final Office Action dated September 18, 2006 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. No claims have been amended and no new matter has been introduced. Claims 1-6, 8-16, 18, and 19 are pending and submitted for consideration herein.

Claims 1-6, 10, 11, and 14-16 stand rejected under 35 U.S.C. §102(e) as being anticipated by *Huang* (U.S. Patent No. 6,728,910). The Office Action took the position that *Huang* teaches each and every element recited in the rejected claims. Applicant traverses the rejection and respectfully submits that each of claims 1-6, 10, 11, and 14-16 recite subject matter that is not taught or disclosed by *Huang*.

Claim 1, the independent claim from which claims 2-9 depend, recites a method that includes determining if a memory is functional based on memory BIST data, selecting a redundant memory section if a portion of the memory is determined to be nonfunctional, determining if at least the selected redundant memory is functional according to a BIST, and updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant.

Claim 10 recites a system including means for determining if a memory is functional based on memory BIST data, means for selecting a redundant memory section if a portion of the memory is determined to be nonfunctional, means for determining if at least the selected redundant memory is functional according to a BIST, and means for

updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant.

Claim 11, the independent claim from which claims 12-19 depend, recites a system having a BIST capable of determining if a memory is functional, and self-adaptive logic, communicatively coupled to the BIST, capable of selecting a redundant memory section if a portion of the memory is determined to be nonfunctional, wherein the BIST is further capable of determining if at least the selected redundant memory is functional, and updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant.

Applicant submits that each of claims 1-6, 10, 11, and 14-16 recite subject matter that is not taught or disclosed by *Huang '910*. More particularly, *Huang '910* teaches a method for self-test and self-repair of a semiconductor memory device. A single built-in self-test (BIST) engine with an extended address range is used to test the entirety of memory, *i.e.*, both redundant and accessible memory portions, as a single array, preferably using a checkerboard bit pattern. In a first stage, faulty rows in each memory portion are identified and their addresses recorded. Known-bad rows in accessible memory are then replaced by known-good redundant rows, and the resulting repaired memory is retested in a second stage. During a second stage, repair of the accessible memory portion is verified, while defects among the redundant portion are ignored.

However, *Huang '910* does not teach or disclose updating the redundant memory data structure to indicate that a selected redundant memory section is no longer

redundant, as recited in each of Applicant's claims 1-6, 10, 11, and 14-16. Rather, *Huang '910* uses the BIST test to determine bad memory locations from a memory block and then "associates" or "pairs" a good memory location in a redundant memory with the determined bad memory location from the memory block via a repair table. Once the association between the bad memory and the good redundant memory is finished, then the BIST re-tests the memory, and skips the bad memory locations during the test and instead tests the associated redundant memory locations in their place, as specified in the repair table. However, nowhere in the testing process described in *Huang '910* is there any teaching or discussion of updating the redundant memory data structure to indicate that a selected redundant memory section is no longer redundant, as recited in each of the rejected claims. *Huang '910* merely creates the repair table, which determines what bad memory locations in the memory block are linked to good (substitute) memory locations in the redundant memory. Nowhere in *Huang '910* is the repair table described as indicating what redundant memory locations in the data structure are no longer available as redundant memory. Therefore, reconsideration and withdrawal of the rejection of claims 1-6, 10, 11, and 14-16 is respectfully requested, as *Huang '910* fails to teach each and every element recited in claims 1-6, 10, 11, and 14-16.

Further supporting Applicant's position with respect to *Huang '910* is the fact the testing process of *Huang '910* does not include a third BIST test, *i.e.*, one BIST test is conducted to determine bad memory locations, and then after the repair table and associations are created, a second BIST test is conducted to make sure that the

associations function properly. If the second BIST test fails, the method of *Huang '910* quits and determines that the memory is faulty and not useable. (See, column 8, lines 40-45.) Therefore, there is no need for the testing method of *Huang '910* to update a redundant memory structure to indicate that a block of the redundant memory (the block used to cover for the bad memory block location) is no longer available, as there is no third or additional testing and association step that would require further association of an available redundant memory location with a bad memory location. Put simply, *Huang '910* doesn't teach or disclose Applicant's recited step of updating the redundant memory data structure, as *Huang '910* doesn't do further testing that would use this information. Therefore, reconsideration and withdrawal of the rejection of claims 1-6, 10, 11, and 14-16 is respectfully requested.

Claim 12 stands rejected under 35 U.S.C. §103(a) as being obvious over *Huang '910* in view of *Huang '066* (U.S. Publication No. 20020136066A1 – hereinafter referred to as *Huang '066*). The Office Action took the position that *Huang '910* teaches each and every element recited in claim 12, except for the self adaptive logic limitations. However, the Office Action cites to *Huang '066* as teaching this feature, and as such, the Office Action concluded that it would have been obvious to one of ordinary skill in the art to have combined the teaching of the references to generate Applicant's claimed invention. Applicant traverses the rejection and respectfully submits that the cited combination of references, when taken alone or in combination, fails to teach, show, or suggest each and every limitation recited in claim 12.

Huang '910 is discussed above. *Huang '066* teaches a system and method for a self-repairing memory that can be integrated with any BIST mechanism, without extensive modification to either the BIST or BISR mechanisms. A BISR "Wrapper" system interfaces the BIST engine to the BISR repair circuitry. The BISR Wrapper makes use of standard status signals present in any BIST engine, and directs the operation of the BISR circuitry. With the Wrapper, BISR operation need no longer be closely coupled to the operation or internal structure of the BIST. Consequently, modification of the BIST mechanism, *e.g.*, to improve fault coverage, can be implemented without influencing the BISR.

However, *Huang '066* does not teach, show, or suggest a BIST that is capable of updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant, as recited in claim 11, the independent claim from which claim 12 depends. As such, Applicant submits that *Huang '066* does not further the teaching of *Huang '066* to the level necessary to properly support an obviousness rejection. Therefore, reconsideration and withdrawal of the rejection of claim 12 is respectfully requested.

Claim 13 stands rejected under 35 U.S.C. §103(a) as being obvious over *Huang '910* in view of *Tanizaki* (U.S. Patent No. 6,993,696). The Office Action took the position that *Huang '910* teaches each and every element recited in claim 13, except for the state of a pin. However, the Office Action cites to *Tanizaki* as teaching this feature,

and as such, the Office Action concluded that it would have been obvious to one of ordinary skill in the art to have combined the teaching of the references to generate Applicant's claimed invention. Applicant traverses the rejection and respectfully submits that the cited combination of references, when taken alone or in combination, fails to teach, show, or suggest each and every limitation recited in claim 13.

Huang '910 is discussed above. *Tanizaki* teaches a semiconductor memory device with a built-in self test circuit includes a semiconductor substrate, a memory cell array formed on the semiconductor substrate, an input buffer provided on the semiconductor substrate to receive externally applied data, a test circuit coupled to the memory cell array and the input buffer on the semiconductor substrate to store a program received through the input buffer to generate test data of the memory cell array according to the stored program to carry out testing of the memory cell array, and a select circuit selectively applying to the memory cell array test data applied from the test circuit and data applied from the input buffer depending upon a test operation and a normal operation.

However, *Tanizaki* does not teach, show, or suggest a BIST that is capable of updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant, as recited in claim 11, the independent claim from which claim 13 depends. As such, Applicant submits that *Tanizaki* does not further the teaching of the *Huang '910* reference to the level necessary to properly support an

obviousness rejection. Therefore, reconsideration and withdrawal of the rejection of claim 13 is respectfully requested.

Claims 8 and 18 stand rejected under 35 U.S.C. §103(a) as being obvious over *Huang '910* in view of *Aipperspach* (U.S. Patent No. 6,181,614). The Office Action took the position that *Huang '910* teaches each and every element recited in claims 8 and 18, except for where the method of performed during the manufacturing process. However, the Office Action cites to *Aipperspach* as teaching this feature, and as such, the Office Action concluded that it would have been obvious to one of ordinary skill in the art to have combined the teaching of the references to generate Applicant's claimed invention. Applicant traverses the rejection and respectfully submits that the cited combination of references, when taken alone or in combination, fails to teach, show, or suggest each and every limitation recited in claims 8 and 18.

Huang '910 is discussed above. *Aipperspach* teaches a circuit arrangement and method of dynamically repairing a redundant memory array utilize dynamically-determined repair information, generated from a memory test performed on the redundant memory array, along with persistently-stored repair information to repair the redundant memory array. In one implementation, the persistent repair information is generated during manufacture to repair manufacturing defects in the array, with the dynamic repair information generated during a power-on reset of the array to address any additional faults arising after initial manufacture and repair of the array. Furthermore, repair of dynamically-determined errors may utilize otherwise unused redundant memory cells in a

redundant memory array, thus minimizing the additional circuitry required to implement dynamic repair functionality with an array.

However, *Aipperspach* does not teach, show, or suggest a BIST that is capable of updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant, as recited in claims 1 and 11, the independent claims from which claims 8 and 18 depend. As such, Applicant submits that *Aipperspach* does not further the teaching of the *Huang '910* reference to the level necessary to properly support an obviousness rejection. Therefore, reconsideration and withdrawal of the rejection of claims 8 and 18 is respectfully requested.

Claims 9 and 19 stand rejected under 35 U.S.C. §103(a) as being obvious over *Huang '910* in view of *Cheston* (U.S. Publication No. 20030014619A1). The Office Action took the position that *Huang '910* teaches each and every element recited in claims 8 and 18, except for where the method is performed during circuit power up. However, the Office Action cites to *Cheston* as teaching this feature, and as such, the Office Action concluded that it would have been obvious to one of ordinary skill in the art to have combined the teaching of the references to generate Applicant's claimed invention. Applicant traverses the rejection and respectfully submits that the cited combination of references, when taken alone or in combination, fails to teach, show, or suggest each and every limitation recited in claims 9 and 19.

Huang '910 is discussed above. *Cheston* teaches a method and system for recovering a master boot record within a data processing system. In the method, a master

boot record recovery setup utility is invoked by a user. In response to invoking the master boot record recovery utility, the master boot record in a first bootable device is copied to an alternate non-volatile storage device. A recovery flag is set within BIOS indicating that the MBR has been securely copied. In response to a failed boot attempted from the first boot device, the copy of said master boot record within said alternate non-volatile storage device is accessed and utilized to boot the system.

However, *Cheston* does not teach, show, or suggest a BIST that is capable of updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant, as recited in claims 1 and 11, the independent claims from which claims 9 and 19 depend. As such, Applicant submits that *Cheston* does not further the teaching of the *Huang '910* reference to the level necessary to properly support an obviousness rejection. Therefore, reconsideration and withdrawal of the rejection of claims 8 and 18 is respectfully requested.

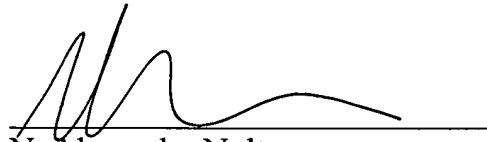
In conclusion, Applicant submits that the cited combination of references, when taken alone or in combination, fails to teach, show, or suggest a BIST that is capable of updating the redundant memory data structure to indicate that the selected redundant memory section is no longer redundant, as recited in each of Applicant's claims. As such, reconsideration and withdrawal of the rejection of the claims is respectfully requested. Claims 1-6, 8-16, and 18-19 are pending and submitted for consideration.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by

telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'N. Alexander Nolte', is written over a horizontal line.

N. Alexander Nolte
Registration No. 45,689

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

NAN:kzw